REMARKS

Claims 1, 3, 5, 14, 16-18, 23, 26, and 29 were previously pending in this application. By this amendment, claims 1, 5, 14, 16-18, 23, 26 and 29 are amended and claims 36-40 are new. As a result, claims 1, 3, 5, 14, 16-18, 23, 26, 29 and 36-40 are pending for examination with claims 1, 14, and 18 being independent claims. No new matter has been added.

I. Rejections Under 35 U.S.C. §102

The Office Action rejects claim 1 under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 5,889,856 (O'Toole). Applicant respectfully traverses this rejection. While Applicant believes claim 1 as previously presented distinguishes over O'Toole, Applicant has amended the claim to more clearly recite the distinctions.

The Office Action asserts that, in O'Toole, the "digital filter circuitry comprises sample rate converter 68 (Fig. 7) that is associated with a variable sampling rate (factor of 125) (Col 9 lines 5-15)." Applicant respectfully disagrees. In particular, O'Toole discloses a sample rate converter having a fixed reduction in sampling rate, not a variable reduction in sampling rate (i.e., the reduction factor does not vary, but rather remains constant). Column 9, lines 5-15 cited in the Office Action state:

> Sample-rate converter 68 changes the sampling rate from about 1 MHz down to 8 kHz. Voice calls can be limited to 8 KHz due to the limited hearing range humans have. The digital values from the A/D converter were sampled from the analog phone line at a much higher rate, about 1 MHz, to capture all the high-frequency data for ADSL. Sample-rate converter 68 reduces the number of digital values by a factor of 125 by averaging successive digital values. (Emphasis added).

That is, sample-rate converter 68 provides a constant reduction factor (i.e., 125). Accordingly, O'Toole shows a standard sample-rate converter having a fixed reduction in sampling rate (i.e., a factor of 125). It should be appreciated that sample rate converter 68 of O'Toole is similar to the fixed ratio ADSL Decimation 138 in Applicant's admitted prior art (see Fig. 9). O'Toole is completely silent with respect to providing a sample rate converter that converts a sample rate by an amount that varies.

Claim 1 recites a device that receives and processes signals from a telephone line and supports a plurality of telephone signal protocols. The device comprises a converter circuit that digitizes input signals received on the telephone line, the converter circuit providing a digital signal having components associated with the plurality of telephone signal protocols, and a digital filter circuit, coupled to the converter circuit to receive the digital signal, the digital filter circuit adapted to convert a sample rate of the digital signal, wherein the digital filter converts the sample rate of the digital signal by an amount that varies to provide a first output signal having a variable sample rate, the first output signal associated with a first of the plurality of telephone signal protocols.

Nowhere does O'Toole disclose or suggest a digital filter circuit to covert a sample rate of a digital signal, "wherein the digital filter converts the sample rate of the digital signal by an amount that varies to provide a first output signal having a variable sample rate," as recited in claim 1. Therefore, claim 1 patentably distinguishes over O'Toole and is in allowable condition.

Claims 3, 5, 36 and 37 depend from claim 1 and are allowable for at least the same reasons.

I. Rejections Under 35 U.S.C. §103

Claims 3, 5, 14, 18, 16, 17, 23, 26 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent No. 5,889,856 (O'Toole) in view of US Patent No. 6,057,793 (Gong). Applicant respectfully traverses this rejection.

The Office Action asserts that it would have been obvious to one of ordinary skill in the art at the time of this application to "implement Gong's variable ratio decimator and interpolator filters in O'Toole's decimation filter stage 60 ... (as such the variable ratio filtering could be implemented on both the xDSL path and the POTS path) for the advantage of allowing the system to process a larger set of input frequencies." However, Applicant respectfully disagrees for at least two reasons: 1) the alleged motivation is nowhere to be found in either O'Toole or Gong; and 2) Applicant does not agree that the purported modification would achieve the alleged advantage.

A. The Office Action Fails To Set Forth a Prima Facie Case of Obviousness

With respect to 1) above, O'Toole discloses an integrated line-card for processing a composite signal of both the high-frequency ADSL data and the low-frequency voice or plain-old-telephone-service (POTS) signal, wherein the line-card implements a digital splitter rather than an analog splitter (Abstract). In particular, the composite signal is provided to A/D converter 44 and the ADSL component and POTS component are then separated by digital splitter 46 in the digital domain (Column 6, lines 42-50). O'Toole discloses a digital splitter 46 including a decimation filter 60 to oversample the output of A/D converter 44 and high pass filter 62 and band-pass filter 66 to separate the ADSL components and the POTS components, respectively. Nowhere does O'Toole suggest that it would be advantageous to employ a variable rate sample rate converter in the digital splitter, nor does O'Toole mention any deficiencies of the digital splitter that could be remedied by such a variable rate sample rate converter. That is, nothing can be gleaned from O'Toole to suggest the desirability of a variable rate sample rate converter.

Gong discloses a digital decimation filter capable of providing a fractional data rate reduction. In particular, using a series decimator, interpolator, decimator arrangement, data rates may be reduced by an integral amount or a fractional amount, and may be switched between the two (Col. 4, lines 35-50). Gong is completely silent with respect to integrated line-cards, ADSL and POTS signal receivers, or any applications thereof, nor is there any suggestion of the benefits of employing the digital decimation filter in the line-card of O'Toole. It should be appreciated that Gong discloses a variable rate decimator only to the extent that switching between integral and fractional reduction ratios is concerned. Gong does not disclose or suggest anything related to the subject-matter of O'Toole or the problems addressed therein. Gong simply discloses an improved digital decimator, which is insufficient to support a motivation to combine.

MPEP §2143.01 states that "[o]bviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge generally available to one of ordinary skill in the art." As

discussed above, neither O'Toole nor Gong provides an explicit teaching that would motivate one skilled in the art to combine the two references.

MPEP §2143.01 further states that the "test for an implicit showing is what the combined teachings, knowledge of one of ordinary skill in the art, and the nature of the problem to be solved as a whole would have suggested to those of ordinary skill in the art." O'Toole is directed to a line-card that provides a single point termination at a central office to a ADSL copper-pair. The solution taught by O'Toole is to replace the conventional analog splitter (having dual termination) with a digital splitter (having a single termination at the A/D converter). Gong is directed to providing a digital decimation filter that allows for both integral and fractional data reduction rates. The nature of the problems solved in the O'Toole and Gong references are entirely different. The nature of the problem of providing an improved decimator and the problem of providing a single terminal line card are so disparate as to lack any indicia of an implicit showing of motivation.

The facts here are similar to those in *In re Fine* (which is cited in MPEP §2143.01), where the claims were directed to a system for detecting and measuring minute quantities of nitrogen compounds comprising a gas chromatograph, a converter which converts nitrogen compounds into nitric oxide by combustion, and a nitric oxide detector. The primary reference disclosed a system for monitoring sulfur compounds comprising a chromatograph, combustion means, and a detector, and the secondary reference taught nitric oxide detectors. The court held that, without more, the mere fact that the detector in the system could be replaced with the nitric oxide detectors was insufficient to support a motivation to combine the two references.

Here, the Office Action purports to replace the digital decimation filter in the O'Toole system with the digital decimator of Gong without any suggestion of the desirability of doing so in either of the references. That one skilled in the art <u>can</u> make a modification is not sufficient to establish that one skilled in the art <u>would</u> be motivated to make the modification (see MPEP page 2100-131 under the heading FACT THAT REFERENCES CAN BE COMBINED OR MODIFIED IS NOT SUFFICIENT TO ESTABLISH PRIMA FACIE OBVIOUSNESS). Accordingly, neither an explicit or implicit motivation to combine is present and the Office

Action has failed to establish a *prima facie* case of obviousness. Therefore, the combination of O'Toole and Gong is improper.

B. The Alleged Advantage of Modification is Not Suggested in the References, Nor Achieved by the Combination

The Office Action asserts that it would have been obvious to one of ordinary skill in the art to "implement Gong's variable ratio decimator and interpolator filters in O'Toole's decimation filter stage 60 ... (as such the variable ratio filtering could be implemented on both the xDSL path and the POTS path) for the advantage of allowing the system to process a larger set of input frequencies" (emphasis added). Applicant respectfully disagrees. First, the line-card in O'Toole, and specifically the digital splitter of the line-card in O'Toole, are fully equipped to process the full range of desired frequencies. The line-card of O'Toole is not limited in the frequencies in which it can process. More particularly, the decimation filter of O'Toole in no way limits the frequencies that the line-card can process. Second, nowhere is there suggestion that the decimation filter of Gong is capable of processing a wider range of frequencies. That is, nothing in the Gong disclosure even suggests that the digital decimation filter can process a wider range of frequencies than conventional decimators.

The specific motivation asserted in the Office Action is therefore improper (in addition to the fact that the motivation is not found in either reference) for two reasons: 1) the purported modification attempts to remedy a problem (limited frequency range) in O'Toole that does not even exist; and 2) the purported modification of the digital decimation filter of Gong would not achieve the alleged advantage of allowing the system of O'Toole to "process a larger set of input sampling frequencies." Accordingly, one skilled in the art would not be motivated to modify O'Toole with Gong in the way set forth in the Office Action and the combination is improper for this additional reason.

For at least the reasons above, the Office Action has failed to establish a *prima facie* case of obviousness. Therefore, Applicant respectfully requests that the rejection of claims 3, 5, 14, 16-18, 23, 26 and 29 in view of the improper combination of O'Toole and Gong be withdrawn.

C. Even if the Combination were Proper, Applicant's Claims Distinguish Over the Combination

i. Claim 14

In the rejection of claim 14, the Office Action takes elements from two different circuits, illustrated respectively in FIGS. 7 and 8. In particular, the Office Action asserts that in O'Toole, the system comprises a "first filter comprising decimation 60 and high pass stage 62 [and] ... [t]he second filter comprises decimation filter stage 60, band-pass stage 66, and rate conversion stage 68 (Fig. 7)." The Office Action further asserts that the system in O'Toole comprises a D/A converter that outputs a combined analog signal (Fig. 8, output from mixer 80). However, the components of O'Toole asserted in the Office Action are portions of different circuits. Specifically, the D/A converter is not connected to the decimation 60, high pass stage 62, band-pass stage 66 or rate conversion 68. The various components selected from the different circuits do not meet all of the limitations of claim 14.

In particular, O'Toole does not show a "digital to analog converter ... that outputs a single analog signal associated with both the first and second protocols in response to the two sample-rate converted digital signals," as recited in claim 14 as previously presented. While Applicant believes that claim 14, as previously presented, distinguishes over the combination of O'Toole and Gong, Applicant has amended claim 14 to more clearly recite the distinctions.

Claim 14, as amended, recites a device that processes signals to be provided over a communication link in support of a plurality of signal protocols, the device comprising a first sample-rate converter that converts a sample rate of a first digital signal associated with a first protocol of the plurality of signal protocols, a second sample-rate converter that converts a sample rate of a second digital signal associated with a second protocol of the plurality of signal protocols, and a digital to analog converter configured to receive a combined digital signal formed from the first digital signal and the second digital signal and to convert the combined digital signal to a single analog signal associated with both the first protocol and the second protocol.

As amended, claim 14 now recites that the digital to analog converter receives a combined digital signal formed from the first and second digital signals provided by the first and second sample rate converters, respectively. O'Toole discloses a single sample-rate converter on the POTS signal path. O'Toole does not disclose or suggest a first and a second sample-rate

converter to provide respective digital signals to form a combined digital signal, which is then converted to a single analog signal by a digital to analog converter, as recited in claim 14. Gong provides no disclosure to cure the deficiencies of O'Toole in this respect. Therefore, claim 14 patentably distinguishes over the combination of O'Toole and Gong and is in allowable condition.

Claims 16 and 17 depend from claim 14 and are allowable for at least the same reasons.

The Office Action asserts that claim 18 is rejected for the same reasons as claim 14. Applicant respectfully points out that claim 14 and claim 18 differ at least with respect to the D/A converter in claim 14 and the A/D converter in claim 18 and the coupling therein. Accordingly, the rejection of claim 14 does not apply to claim 18. The Office Action asserts that by replacing decimation filter 60 of O'Toole with the digital decimation filter of Gong, all of the limitations of claim 18 would be met. Applicant respectfully disagrees. The combination would result in Gong's digital decimation filter receiving the digital signal from A/D converter 44 and sample rate converter 68 receiving the digital signal from band-pass filter 68, after the xDSL component has been filtered out. That is, the combination fails to disclose or suggest two decimation filters, each of which receive the digital signal from the A/D converter, wherein the digital signal includes components associated with both ADSL and POTS signal protocols. Stated differently, the second of the decimation filters in O'Toole receives a signal having only POTS components, not ADSL and POTS components.

Claim 18 recites a device that receives and processes signals from a communication link and supports a plurality of signal protocols. The device comprises an analog to digital (A/D) converter, coupled to the communication link, that receives an analog input signal indicative of a signal on the communication link and outputs a digital signal sampled data stream representative of the analog input signal, the digital signal having components associated with the plurality of signal protocols, and a digital filter, coupled to the A/D converter, the digital filter comprising, a first decimation filter that receives the digital signal and converts a sample rate of the digital signal to provide a first sample-rate converted digital signal having a first sample rate, the first sample-rate converted digital signal associated with a first of the plurality of protocols, and a second decimation filter that receives the digital signal and converts the sample rate of the digital

signal to provide a second sample-rate converted digital signal having a second sample rate, the second sample-rate converted digital signal associated with a second of the plurality of protocols.

Nowhere does the combination of O'Toole and Gong disclose or suggest a first decimation filter and a second decimation filter, both of which receive a digital signal from the A/D converter, wherein digital signal received by both filters has components associated with the plurality of signal protocols, as recited in claim 18. Therefore, claim 18 patentably distinguishes over the combination and is in allowable condition.

Claims 23, 26, 29 and 38-40 depend from claim 18 and are allowable for at least the same reasons.

CONCLUSION

In view of the foregoing amendments and remarks, this application should now be in condition for allowance. A notice to this effect is respectfully requested. If the Examiner believes, after this amendment, that the application is not in condition for allowance, the Examiner is requested to call the Applicant's attorney at the telephone number listed below.

A request for an extension of time, and a check for the associated fee, are submitted herewith. If any additional fee is occasioned by this response, and is not covered by the enclosed check, please charge any deficiency to Deposit Account No. 23/2825.

Respectfully submitted,
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